



**National Aeronautics
and Space Administration**

Issued: June 23, 2000

CAN 00-OSS-01

Cooperative Agreement Notice

NASA Astrobiology Institute Cycle – 2

Notice of Intent Due:
Proposals Due:

August 4, 2000
September 22, 2000

Cooperative Agreement Notice
Soliciting Proposals To Become a Member of the
NASA Astrobiology Institute
(NAI)

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Office of Space Science
National Aeronautics and Space Administration
Washington, DC 20546-0001

1.0 Introduction

This Cooperative Agreement Notice (CAN) solicits proposals to add members to the NASA Astrobiology Institute (NAI). Participation in this solicitation is open to all categories of organizations, domestic and foreign, including industry, educational institutions, nonprofit organizations, NASA centers, and other Government agencies. If teaming arrangements are established, the proposal should be submitted by the lead organization. It should be noted that a Cooperative Agreement implies that a substantial involvement is expected between NASA and the recipient during the performance of the proposed and selected activity.

Astrobiology is, primarily, a basic research discovery program. Originality and innovation by the constituent institutional members and scientists are encouraged.

The primary purpose of the NAI is to enable world-class interdisciplinary research in Astrobiology. Astrobiology is defined as the study of the origin, evolution, distribution, and future of life in the universe. It includes the study of the roles of physical forces, planetary atmospheres, and ecosystem interactions in the evolution of living systems. The NAI also coordinates and catalyzes Astrobiology research across a range of science disciplines and organizations, provides scientific and technical guidance on the Astrobiology aspects of current and future NASA missions, develops and demonstrates modern communications technologies in support of interdisciplinary research, participates in training students at the college and graduate levels, leads in developing

K-14 education programs focused on Astrobiology, and provides outreach to the general public. A defining characteristic of the research done by the NAI is the formation of interdisciplinary teams of researchers to attack major questions in Astrobiology across a broad scientific front.

Astrobiology necessarily cuts across the wide range of disciplines represented by the science supported in three NASA enterprises: Space Science, Earth Science, and Human Exploration and Development of Space. The Astrobiology Institute represents a cooperative effort between these three NASA Enterprises to encourage multidisciplinary research that may not be easily accomplished within their current structure, that leverages research efforts from other NASA enterprises and other Government agencies, and that broadens research activities to help meet enterprise strategic goals.

The research organizations that currently make up the NAI are geographically dispersed. The members themselves carry out the interdisciplinary research, but gain access to expertise in diverse fields through NAI. This structure is necessary to ensure that the NAI has the breadth and talent to address the range of fundamental questions inherent in Astrobiology. Accordingly, the universities, NASA centers, and other research entities that make up the Institute are or will be tied together by an electronic network or networks; by frequent personnel exchanges; by an ongoing series of workshops, seminars, and courses; and by sharing common research interests.

The concept for this Institute is relatively new and is, by necessity, still experimental. NASA's goal for the Institute--and one of the Institute's principal challenges--is to use the tools and activities mentioned above, together with others as appropriate, to continue to establish a close and scientifically productive interaction among its members, even though they are geographically separated. Achieving this goal will take time; the scope and nature of the Institute is still evolving. The research enabled by the Institute complements the research carried out by individual Principal Investigators in NASA grants programs relevant to Astrobiology.

Membership in the NAI is based on a competitive peer reviewed selection process that is open to the research community in general. The scope of proposed participation will be dependent upon the nature of the interdisciplinary research proposed and on the commitment of resources on the part of the proposing organization. Proposals from non-U.S. institutions are welcome and subject to guidelines in Section 9.2

2.0 Background and Science Scope

2.1 General

Many elements of NASA's current science and exploration program fall wholly or partly within the broadly defined area of science encompassed by Astrobiology. These include aspects of three of NASA's Strategic Enterprises: Space Science, Earth Science, and the Human Exploration and Development of Space. NASA's Astrobiology Program provides the scientific basis for coordinating these activities to maximize progress in understanding life's origin, evolution, distribution, and future in the universe.

Recent discoveries have stimulated widespread excitement in Astrobiology. These include the accumulating evidence for the ability of terrestrial organisms to thrive in a wide variety of extreme environments on Earth, together with the discovery in the past few years of planets orbiting other stars, including a planetary system of at least three planets, the likelihood that Mars had ancient oceans and that Europa has an ice-covered ocean today, possible evidence for fossils in Martian meteorites, and the possibility that there are fundamental changes in gene expression in microgravity. Two major science themes in the Office of Space Science, the Search for Astrophysical Origins and Planetary Systems, and Solar System Exploration, have a major emphasis on reaching an understanding of the origin and distribution of life in the Universe and the search for extraterrestrial life in the Solar System and beyond. NASA's program in Astrobiology, therefore, has substantial overlap with the Astrophysical Origins and Solar System Exploration programs. However, Astrobiology extends beyond these themes to encompass questions dealing with the adaptability of terrestrial biota to nonterrestrial environments that are of major interest to the Office of Life and Microgravity Sciences and Applications and the development and evolution of ecosystems on Earth and their interaction with their changing environments, especially when those changes are rapid, which is a fundamental theme of the research program in the Office of Earth Science. Program information, such as the NASA Strategic Plan and descriptions of the relevant research programs, can be found through the home pages of the three Offices: at <http://spacescience.nasa.gov>, <http://www.hq.nasa.gov/office/olmsa/index.htm>, and <http://www.earth.nasa.gov>.

In the summer of 1998, NASA and the science community created a roadmap for Astrobiology that describes the scientific goals and objectives for this program. The complete Astrobiology Roadmap is available on the Astrobiology web site at <http://astrobiology.arc.nasa.gov/roadmap>. The following three questions and associated ten goals, taken from the Roadmap, exemplify the breadth and depth of Astrobiology:

- How does life begin and develop?
 1. Understand how life arose on the Earth.
 2. Determine the general principles governing the organization of matter into living systems.
 3. Explore how life evolves on the molecular, organism, and ecosystem levels.
 4. Determine how the terrestrial biosphere has co-evolved with the Earth.
- Does life exist elsewhere in the Universe?
 5. Establish limits for life in environments that provide analogues for conditions on other worlds.
 6. Determine what makes a planet habitable and how common these worlds are in the Universe.
 7. Determine how to recognize the signature of life on other worlds.
 8. Determine whether there is (or once was) life elsewhere in our solar system, particularly on Mars and Europa.
- What is life's future on Earth and beyond?
 9. Determine how ecosystems respond to environmental change on time-scales relevant to human life on Earth.
 10. Understand the response of terrestrial life to conditions in space or on other planets.

The breadth of Astrobiology is such that single research projects cannot possibly encompass the entire program. The research activities of the current NAI teams are representative of the interdisciplinary nature of research needed to meet Astrobiology goals. A detailed description of the research of NAI Members is available at the Institute's web page at <http://nai.arc.nasa.gov>

Also available on the internet are workshop reports which may provide useful background information. These reports can be found at <http://astrobiology.arc.nasa.gov>. In most cases, hard copies can also be provided by submitting a request to:

Dr. Rosalind Grymes
Assistant Director
NASA Astrobiology Institute
Mail Stop 240-1
Ames Research Center
National Aeronautics and Space Administration
Moffett Field, CA 94035-1000
Phone: (650) 604-0809 (NAI Secretary)
E-mail: NAIcon2@mail.arc.nasa.gov

2.2 Specific Objectives

In general, NASA will entertain proposals addressing one or more of the research goals of Astrobiology. **However, in order to fill some perceived gaps in the current NAI research program, strong preference will be given to proposals that:** (a) address the general issue of the nature and/or search for habitable worlds outside the solar system, as well as methods for detecting the presence of life thereon; (b) explore the role of ecosystem processes (e.g., large-scale episodic disturbance, nutrient dynamics and trace gas production, biogeographic change) in the global carbon cycle and other biogeochemical cycling processes on centennial to millennial time scales with a goal of contributing understanding that could advance our ability to predict future conditions; and c) provide understanding of the response of life to the space environment, from gene expression to microbial evolution and ecological interactions. In addition, though much of the research in the NAI has a sound theoretical footing, NASA would like to encourage candidate members to propose means to extend the theoretical framework into the biological sciences, both at the fundamental molecular level, as well as at higher levels of system complexity.

3.0 General Scope and Activities of the Institute

Definition of Terms

- Institute = NAI
- Institution = any research organization
- Principal Investigator (PI) = scientist who is the leader of the research team
- Lead Institution = PI's home institution and the research organization submitting the proposal, either individually or on behalf of a group of cooperating institutions
- Co-institution = any of the group of cooperating institutions other than the lead institution
- Team = the group of scientists from the lead institution and co-institutions who will carry out the proposed research. Each team is identified by the name of the lead institution
- NAI Member = any scientist who is a member of one or more of the teams

NASA established the Astrobiology Institute, whose members and their institutions were chosen through the first NAI CAN, to promote research in Astrobiology with emphasis on interdisciplinary team efforts directed at major questions. This virtual Institute exploits modern communications and information technology to bind together institutions and research teams in geographically separated locales to enable an unprecedented degree of interaction of remotely located participants to pursue common research goals. The purpose of this second NAI CAN is to add additional teams to the current NAI, **particularly in science areas where Roadmap goals are currently underrepresented** (see Section 2.2 above).

The Institute draws its strength both from the cadre of experienced researchers at all the cooperating institutions and from an active core of junior faculty, postdoctoral fellows, and students who work and train together and who will develop innovative ways to cooperate and collaborate, including extensive use of the communication networks of the twenty-first century.

An Institute-wide postdoctoral program, under the auspices of the National Research Council, has been established by the NAI, and the first round of applications for fellowships available to promising candidates have been accepted. Funding for successful candidates is independent of the host institution, and candidates are encouraged to work closely with more than one host institution as appropriate to pursue their research interests. More information is available at <http://www.national-academies.org/rap> (search for NASA Astrobiology Institute), or contact:

Dr. Robert Manka, Associate Director, or
Ms. Jacinta Kelly, Program Coordinator
National Research Council
Associateship Programs (TJ 2114/NA)
2101 Constitution Ave NW
Washington, DC 20418
Phone: (202) 334-2760
E-mail: astrobio@nas.edu

Excellence in interdisciplinary research is a major priority of the Institute. However, NASA also expects the Institute to lead in identifying and developing new program directions and mission and technology requirements; in the coordination, integration, and communication of interdisciplinary and multiorganizational contributions; and in the development of a new generation of astrobiologists.

A major goal of NASA's program in Astrobiology is to capitalize on the great public appeal of Astrobiology by building an education and outreach program to share the excitement of discovery with the citizens of the U.S. and the world at large. As did the current NAI teams, new teams are strongly encouraged to propose and develop their own education and public outreach programs and to work with the Institute Director's office to integrate these separate programs. The education and public outreach policies of

Partnerships in Education: A Strategy for Integrating Education and Public Outreach into NASA's Space Science Programs," and an implementation plan, entitled "*Implementing the Office of Space Science (OSS) Education/Public Outreach Strategy,*" available on the OSS home page <http://spacescience.nasa.gov>, open "Education and Outreach" (see also Section 5.4 and Appendix C).

The scope and nature of the Institute will evolve over time and in cooperation with the members. However, in order to fulfill its primary role of enabling interdisciplinary research between members, at a minimum, the Institute's activities currently include or are expected to include:

- Encouraging frequent scientific interchange among NAI members.
- Fostering exchanges of scientists at all levels among cooperating institutions.
- Helping to coordinate undergraduate and graduate cross-training programs that will allow students in one discipline area of Astrobiology to study and work in another allied discipline, thus training a new generation of interdisciplinary scientists (part of this effort may include summer schools for undergraduate and graduate students).
- Organizing and coordinating seminars and workshops, including those that will utilize high performance networks to link the member NAI institutions; offering courses in Astrobiology through those networks, drawing on the broad range of expertise across the membership to set up and teach the classes and establish a new course of study; and organizing workshops to determine the need and establish priorities for national facilities for Astrobiology research.
- Coordinating the Teams' programs in education and public outreach.
- Exploring and exploiting the technology of high performance networking and applications software as a tool for conducting research and fostering scientific exchange (see Section 5.3 for more information on networking).
- Establishing an information repository and distribution center for Astrobiology including, for example, scientific products of members, materials for education and public outreach, and results of community assessment of directions and priorities in the field.

4.0 Roles of Teams and Members

The Principal Investigator will lead their respective NAI Team, which is expected to: actively pursue its peer-reviewed and selected research program; participate actively in Institute activities such as workshops, seminars, classes, training, and education and public outreach; and work to continuously improve the effectiveness of the intermember connections and collaborations. Much of the interaction is expected to take place through electronic networks, including high performance communications linkages, although travel will also be necessary. In addition to travel to professional meetings, proposals should anticipate appropriate attendance by small subsets of the team at several NAI workshops annually and attendance of a substantial portion of the team at an annual NAI science conference. In addition, the NAI Executive Council, consisting of the NAI PI's will meet four times annually. To estimate the required travel budget, candidates should

assume the workshops and annual conference will alternate between sites around the country, while the four Executive Council meetings will ordinarily be held at NASA Ames Research Center.

NASA contributes to the cooperative agreement by providing the Institute Director's office and staff, which is housed at NASA Ames Research Center and takes responsibility for: coordinating activities; disbursing funds (including a small Director's Discretionary Fund for high-risk/high-payoff research projects and for fostering collaboration between members); sponsoring the NAI postdoctoral fellowship program in collaboration with the NRC; organizing and leading workshops; coordinating the Institute's programs in education and public outreach; and expediting network connectivity and helping to engineer the interfaces between the scientists and the network. Depending on the extent to which NASA is involved in selected research, these activities would also represent NASA's contributions.

The Director of the NAI is Dr. Baruch Blumberg. He has formed an Executive Council made up of delegates from the member institutions, which is the principal internal technical guiding body of the Institute. In addition, Dr. Blumberg has established the NAI Director's Science Council (Appendix A), a group of distinguished scientists from outside of the NAI, who will assist him in reviewing the progress of the NAI and in advocating new research directions. Members of the Director's Science Council are encouraged to visit the NAI Lead Institutions on an *ad hoc* basis for informal and formal consultations.

5.0 Nature of Proposals

5.1 General Scope

Proposals submitted in response to this CAN (see Appendix B) will be evaluated on their merits, based on the evaluation criteria given in Section 6.0.

Proposals should clearly articulate the innovative interdisciplinary research program to be performed and the long-term institutional commitment to Astrobiology and to the NAI. The term "institutional commitment" is intended to include those aspects of the existing or proposed infrastructure that contribute or will contribute in a substantial way to the development of the field of Astrobiology and the NAI. Examples include: training of undergraduate, graduate, and postgraduate researchers in Astrobiology; academic degree programs in Astrobiology; departments of and centers for Astrobiology, including permanent (e.g., tenured and/or tenure track, civil service, etc.) positions; offices, laboratories, other experimental facilities, and associated research groups that can be shown to be of direct and substantive benefit to the Institute and/or the proposed research program; computational facilities for research in computational Astrobiology; and engineering and technology planning and development capabilities which allow substantive contributions to existing or planned NASA missions, with direct relevance to Astrobiology research goals. **In general, commitment of critical resources that are**

offered at no cost to NASA's Astrobiology program clearly constitutes institutional commitment.

Where appropriate, the involvement of researchers from more than one institution may be required to provide the full range of expertise essential to carry out the proposed program.

See Section 7.0 for the available funding.

5.2 Desirability for Teaming with Underrepresented and Minority Institutions

NASA agency-wide recognizes that critical steps must be taken to broaden the participation of underrepresented groups and minority institutions in NASA research programs and missions. According to *NASA's 1996 Science Policy Guide*, "The economic vitality of our nation depends increasingly on new scientific knowledge and its application. For NASA, this means ensuring that the ideas and capabilities of the widest possible talent pool are brought to bear on its missions." Further, to ensure that a continuing supply of scientists, engineers, and technologists will be available to meet the needs of the twenty-first century in the Space Science Enterprise, the *Space Science Enterprise Strategic Plan* "... promotes the involvement of undeserved/underutilized groups in Space Science education and outreach programs and their participation in Space Science research and development activities..." The *Earth Science Strategic Enterprise Plan 1998-2002* also calls for diversity in the NASA Earth Science work force and science community. Therefore, this CAN encourages the development of meaningful connections among the NASA Enterprises, the space science research community, and minority institutions through the establishment of strong linkages. Institutions (either minority or nonminority) interested in establishing such collaborations are invited to submit this information online to the NAI CAN web site at <http://nai.arc.nasa.gov/can2>. The information should include area of study, proposer's intentions, and contact information. Groups looking to find a partnership or join a partnership can examine the information posted on the NAI CAN web site to expedite the teaming process.

For purposes of the announcement, minority universities are identified by NASA's Office of Equal Opportunity Programs as an accredited minority college or university referred to as an Other Minority University (OMU) as defined in the Higher Education Act [See 20 USC 1135d and 34 CFR 637.4b]; a Historically Black College or University (HBCU) under Title III of the Higher Education Act of 1965 as amended [See 34 CFR 608.2]; a Hispanic-Serving Institution (HSI) under Title III of the Higher Education Act of 1965 as amended [See 20 USC 1059 (c)]; Public Law 102-325, Section 306, July 22, 1992]; a Tribal College or University (TCU) cited in Section 532 of the Equity in Education Land Grant Status October 1994; Tribally Controlled Community College Assistance Act of 1978; or the Navajo Community College Assistance Act of 1978, Public Law 95-471. A list of the Department of Education designated minority institutions may be obtained through the World Wide Web at <http://www.ed.gov/offices/OCR/2000minority.html>.

5.3 Network Communications

Proposers are encouraged to suggest creative and innovative ways to use modern communication technologies to enable research, training, collaboration, and other interactions to further the field of Astrobiology. Applications having a need for very high bandwidths, as characterized by many data sets of large size coupled with an element of time urgency, should identify this need.

Varying levels of networking capability are available to potential proposers. For example, many such institutions and/or Government laboratories are already connected or approved for connection to high speed networks through initiatives like Internet 2 and the Next Generation Internet (NGI). However, proposals will not be evaluated based on current network capability, or lack thereof. After selection, the Institute will help to expedite proposals for network connections (see Section 8.0).

5.4 Education and Public Outreach (E/PO)

A major activity of the NAI is in the area of K-14 education and contributing to broad public understanding of science and technology (see Section 3.0 above and Appendix C for further details and guidelines). Therefore, a strongly desired part of every proposal submitted in response to this CAN is a substantive E/PO effort (up to 5% of the proposed budget) that would be carried out by the proposer if chosen. It is expected that, following selection, such an effort would be coordinated with the E/PO efforts of the NAI. The commitment of the NAI to public outreach, K-14 education, and advanced student training is well established. It is expected that all proposers will include an appropriate commitment to these activities in their negotiated award (if selected), whether or not they elect to provide a formal E/PO section in their proposal at this time.

6.0 Proposal Evaluation Criteria and Selection Procedures

The criteria for evaluation of proposals in response to this CAN are listed below in descending order of importance (the percentage of each element's contribution to the overall score of the proposal is given in parentheses):

1. Scientific and technical merit of the proposed interdisciplinary research program, including basic innovative and novel approaches to fulfill the research directions, and the likelihood that substantial progress can be made during the proposed duration of the effort. This criterion includes: scientific breadth of the proposed research, plans for coordination of the various established science disciplines proposed to accomplish the research, and quality of scientific staff. (50%)

This criterion has two important subelements:

- (a) Proposed level and quality of long term institutional commitment of the proposing research organization to the Institute and to the emerging field of Astrobiology, including training of students and postdoctoral fellows who will make up the next generation of Astrobiology researchers (see Section 5.0 above for definition of institutional commitment); and
 - (b) Proposed approaches to strengthen the ties among members of the Institute and increase its overall scientific productivity including, for example, ways to use modern information technology, exchange of personnel, and/or other innovative means of interaction. This subelement includes approaches that are intended to be implemented by the proposing institution, as well as ideas for Institute-wide activities to supplement the examples given in this CAN.
2. Relevance to NASA's program in Astrobiology, as outlined in the Astrobiology Roadmap (see Section 2.1) and responsiveness to this CAN (30%).
 3. Realism, reasonableness, and total amount of the proposed cost (20%).

The quality of the proposed education and public outreach programs, their alignment with OSS's overall approach to education and public outreach (see Section 5.4 and Appendix C), and the indicated willingness of proposers to integrate their efforts with existing activities of NAI's Outreach Office will also be considered and will play a role in the selection process in discriminating among closely competing proposals. Even if the proposers choose not to submit a formal E/PO component with their proposals at this time, it is expected that every award will include a commitment to contribute to NAI's coordinated education/outreach efforts in substantive ways.

In making the selections, NASA will also consider overall program diversity, originality, and balance (see Section 2.2) in order to incorporate a range of institutional commitments and to cover a wide variety of scientific questions while maintaining the coherence of the Institute. Cultural diversity is encouraged (see also Section 5.2).

The evaluation of the proposals will be conducted by an independent outside peer review panel. Results of this review will be integrated into a recommended program plan that meets NASA's programmatic objectives, as given above, by a recommendation panel composed of NASA personnel. Those proposals that most clearly meet the criteria outlined above, as judged by the peer panel and the recommendation panel, will be recommended to the Selecting Official, who is identified in Section 9.1. NASA reserves the right to conduct site visits at the proposing institutions as part of the review process.

7.0 Budget and Duration of Agreements

Proposals may request periods of performance of up to five years. Funding should be proposed on an annual basis, beginning approximately September 2000 or later. NASA expects to select up to three investigations in response to this CAN. The expected total level of funding available to be divided among these new NAI members for the first full year is \$2.4M; that figure is expected to increase with inflation for the remaining years of the awards. An additional budget will be available for funding the current NAI members, administration, and infrastructure. Note that all budget figures are subject to change as a result of the annual Federal budget process.

Although proposals may be submitted for up to five years duration, with opportunities to compete for subsequent renewal periods of five years, the research activities will be reviewed at least every three years as required by Federal regulations. Duration of this Institute Program is expected to be at least 20 years.

NASA may elect to select all or part of a successful proposal. In case one or more of the proposals received in response to this solicitation is deemed meritorious of funding, but in need of greater definition, NASA reserves the right to provide interim funding for NAI involvement while the proposal undergoes further development, with the understanding that a revised proposal will be submitted for independent peer review at a time to be determined in the negotiation for the cooperative agreement. An additional CAN may be issued in FY 2002 or later to solicit additional members.

8.0 Proposed Costs and Resource Arrangements

8.1 Special Conditions

For the purpose of evaluation, all costs to the Federal Government (except as noted below) must be included in the proposed budget. Where NASA provided services are proposed (see pricing collaborations described in Section 4.0), NASA Civil Service labor and supporting NASA Center infrastructure must be costed on a full cost accounting basis. If NASA guidance for full cost accounting has not been fully developed by the closing date for proposal submission, NASA Centers may submit full cost proposals based on the instructions in the *NASA Financial Management Manual*, Section 9091-5, "Cost Principles for Reimbursable Agreements," or based on their own Center-approved full cost accounting models. Other Federal Government elements of proposals must follow their agency's cost accounting standards for full cost. If no standards are in effect, the proposers must then follow *the Managerial Cost Accounting Standards for the Federal Government* as recommended by the Federal Accounting Standards Advisory Board.

Note that partnering, in which NASA scientists and scientists from other Federal laboratories are involved, can take a number of forms, formal and informal. Any and all valid mechanisms are open for consideration. Examples include: Intergovernmental Personnel Act (IPA) appointments; leaves of absence or sabbaticals to participate on site at either of the institutions; Memoranda of Understanding (MOU's) for shared facility usage; arrangements for joint appointments; and opportunities for Government scientists to teach at accredited universities.

Any equipment essential for the research proposed or use of high performance networks must be included in the proposed budget. The exception is that costs associated with connecting a selected institution to one of the existing high performance networks should not be included. Such costs will be negotiated in establishing the individual cooperative agreements. However, any costs associated with the hardware or software that the proposing institutions require to implement proposed approaches to intermember interactions should be included.

8.2 Administration of Funding

Ames Research Center will negotiate Cooperative Agreements with successful proposing institutions and will administer all funding. Except as provided below, Cooperative Agreements in accordance with regulations 14 CFR Part 1260 for educational and nonprofit institutions, and 14 CFR part 1274 for commercial organizations will be used as funding instruments for the Astrobiology Institute (*see Grant and Cooperative Agreement Handbook*, NPG 5800.1D, available at <http://procure.msfc.nasa.gov/grcover.htm>).

Specific resource arrangements established under this notice may vary depending on the nature of the Principal Investigator's home organization. Resource arrangements fall into the categories sited below. Institutions of Higher Education, Nonprofit Organizations, and State and Local Government. For universities, nonprofit organizations, and state and local governments, Cooperative Agreements will be negotiated.

For-Profit Organizations. In the case of for-profit organizations, Cooperative Agreements will be negotiated with cost-sharing requirements. The total NASA contribution to the Cooperative Agreement will not exceed 50% of the total project value. Note that profits or fees are not allowable or payable under Cooperative Agreements. To the extent that a for-profit organization teams with an institution of higher education, nonprofit organization, or state or local government, the for-profit organization is expected to provide at least 50% of the costs of its own participation.

National Laboratories. For successful proposers from National laboratories (not including civil service or military staff laboratories, but only Government-owned, contractor-operated laboratories), necessary resources will be provided via an interagency funds transfer and documented under a memorandum of agreement between the sponsoring organization and NASA.

Other Agency Laboratories. Non-NASA Government owned-Government operated laboratory personnel may propose in response to this CAN. For such participants, necessary resources will be provided via an interagency funds transfer and will be documented using a memorandum of agreement between the other agency laboratory and NASA. Negotiated project resources may be used to cover direct project costs.

NASA Centers

- (a) NASA personnel may be part of a proposing team. The portion of NASA involvement will be delineated in the negotiated Cooperative Agreement as part of NASA's responsibilities. The costs of NASA participation will be funded using NASA's internal funding procedures and not identified as a cost under the Cooperative Agreement. However, as stated above, the cost associated with NASA participation, using currently specified requirements for full cost accounting, must be included in the total cost of the proposal for evaluation purposes.
- (b) NASA-led proposals may be submitted in response to this solicitation. For successful proposers within NASA, the necessary resources will be provided via NASA's internal funding procedures. If researchers from other institutions are included on a successful NASA-led proposal, then the necessary resources will be provided through the funding mechanisms given above, as appropriate.
- (c) Non-US Institutions. Proposal funding limitations for non-US institutions are discussed in Section 9.2

9.0 Proposal Submission Information

NASA desires to receive Notices of Intent to aid in establishing a peer review panel that is free from conflict of interest and containing the appropriate expertise. Notices of Intent are to be submitted electronically in accordance with the details in section 8.2, Appendix B. Notices of Intent will be treated as competition-sensitive material; however, they are in no way binding on the individuals or the institutions.

9.1 Information on this Opportunity

Detailed information for preparing a proposal in response to this CAN is included in the following appendices. Appendix B provides instructions to the proposers and contains sample forms and certifications required for proposal submission. Appendix C provides information on submitting E/PO components of proposals as well as further information on the basis on which the E/PO components of proposals will be evaluated. The CAN and related information is available through the NAI CAN web site at <http://nai.arc.nasa.gov/can2> or the CAN is available through the OSS home page at: <http://spacescience.nasa.gov>, open "Research Opportunities."

Identifier: CAN 00-OSS-01

*Submit Notice of Intent (NOI)
& proposal front page to:* <http://props.oss.hq.nasa.gov>

Submit Proposal to: Dr. R. Grymes
Assistant Director
NASA Astrobiology Institute
MS 240-1
Ames Research Center
National Aeronautics and Space Administration
Moffett Field, CA 94035-1000

Notices of Intent Due: August 4, 2000

Proposal Due Date: September 22, 2000

Number of Copies Required: 20 (including signed original)

Selecting Official Associate Administrator for Space Science

Selections Announced: after September 2000

Questions specifically about this solicitation should be submitted to the NAI CAN web site or addressed to the above address. Where appropriate, questions and answers will be made publicly available on the NAI CAN web site. Note: questions and answers will be accepted up to 2 weeks before the CAN proposals are due.

Additional programmatic information about the Astrobiology Program may be obtained from:

Dr. Michael Meyer
Research Program Management Division
Code SR
Office of Space Science
NASA Headquarters
Washington, DC 20546
Phone: (202) 358-0307
Fax: (202) 358-3097
E-mail: mmeyer@hq.nasa.gov

9.2 Guidelines for Non-U.S. Participation

Additional Guidelines Applicable to Foreign Proposals and Proposals Including Foreign Participation.

(1) NASA welcomes proposals from outside the U.S. However, foreign entities are generally not eligible for funding from NASA. Therefore, unless otherwise noted, proposals from foreign entities should not include a cost plan unless the proposal involves collaboration with a U.S. institution, in which case a cost plan for only the participation of the U.S. entity must be included. Proposals from foreign entities and proposals from U.S. entities that include foreign participation must be endorsed by the respective government agency or funding/sponsoring institution in the country from which the foreign entity is proposing. Such endorsement should indicate that the proposal merits careful consideration by NASA, and if the proposal is selected, sufficient funds will be made available to undertake the activity as proposed.

(2) All foreign proposals must be typewritten in English and comply with all other submission requirements stated in the NRA. All foreign proposals will undergo the same evaluation and selection process as those originating in the U.S. All proposals must be received before the established closing date. Those received after the closing date will be treated in accordance with Appendix B Section B.1.1 of this provision. Foreign sponsors may, in exceptional situations, forward a proposal without endorsement if the endorsement is not possible before the announced closing date. In such cases, the NASA sponsoring office should be advised when a decision on endorsement can be expected.

(3) Successful and unsuccessful foreign entities will be contacted directly by the NASA sponsoring office. Copies of these letters will be sent to the foreign sponsor. Should a foreign proposal or a U.S. proposal with foreign participation be selected, NASA's Office of External Relations will arrange with the foreign sponsor for the proposed participation on a no-exchange-of-funds basis, in which NASA and the foreign sponsor will each bear the cost of discharging their respective responsibilities.

(4) Depending on the nature and extent of the proposed cooperation, these arrangements may entail:

- (i) An exchange of letters between NASA and the foreign sponsor; or
- (ii) A formal Agency-to-Agency Memorandum of Understanding (MOU).

Export Control Guidelines Applicable to Foreign Proposals and Proposals Including Foreign Participation.

(1) Foreign proposals and proposals including foreign participation must include a section discussing compliance with U.S. export laws and regulations, e.g., 22 CFR Parts 120-130 and 15 CFR Parts 730-774, as applicable to the circumstances surrounding the particular foreign participation. The discussion must describe in detail the proposed foreign participation and is to include, but not be limited to, whether or not the foreign

participation may require the prospective proposer to obtain the prior approval of the Department of State or the Department of Commerce via a technical assistance agreement or an export license, or whether a license exemption/exception may apply. If prior approvals via licenses are necessary, discuss whether the license has been applied for or if not, the projected timing of the application and any implications for the schedule. Information regarding U.S. export regulations is available at <http://www.pmdtc.org> and <http://www.bxa.doc.gov>. Proposers are advised that under U.S. law and regulations, spacecraft and their specifically designed, modified, or configured systems, components, and parts are generally considered "Defense Articles" on the United States Munitions List and subject to the provisions of the International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120-130.

Associated Institutions

In those cases outside the U.S. where a strong national program in astrobiology already exists, another mechanism, independent from this CAN, is in place for researchers to participate in the NAI. When both countries judge that establishment of Associated Institutions would be in their best interests, an international agreement may be negotiated between NASA and the non-U.S. national agency to spell out the terms of the arrangement. The specific form of the agreement will be determined on a case-by-case basis.

NASA and Instituto Nacional De Tecnica Aeroespacial (INTA) of Spain have concluded an agreement for cooperation between the NAI and the Centro De Astrobiologia (Center for Astrobiology [CAB]).

Non-U.S. research groups, institutions, or consortia that are interested in exploring mutual science interests should contact:

Dr. Baruch Blumberg, Director
or Dr. Rosalind Grymes, Assistant Director
NASA Astrobiology Institute
MS 240-1
Ames Research Center
National Aeronautics and Space Administration
Moffett Field, CA 94035
E-mail: bblumberg@mail.arc.nasa.gov
rgrymes@mail.arc.nasa.gov

10.0 Conclusion

Through this solicitation, NASA is adding to the innovative and interdisciplinary research in Astrobiology. The NASA Astrobiology Institute continues to be new and experimental. Your participation in this important activity is encouraged and appreciated.

Edward J. Weiler
Associate Administrator
for Space Science

Ghassem Asrar
Associate Administrator
for Earth Science

Arnauld E. Nicogossian
Associate Administrator
for Life and Microgravity
Sciences and Applications

NAI Director's Science Council Members

Altman, Sidney
Yale University
Molecular Biology
Nobel/Chemistry '89

Brenner, Sydney
Molecular Sciences Institute
Molecular Biology

Greeley, Ronald
Arizona State University
Geology

Lederberg, Joshua
The Rockefeller University
Genetics
Nobel/ Medicine or Physiology '58

Roberts, Richard
New England BioLabs
Molecular Biology
Nobel/Medicine or Physiology '93

Singer, Maxine F.
Carnegie Institution of Washington
Biochemistry

Anderson, Philip W.
Princeton University
Theoretical Physics
Nobel/Physics '77

Gell-Mann, Murray
Santa Fe Institute
Theoretical Physics
Nobel/Physics '69

Laughlin, Robert B.
Stanford University
Physics
Nobel/Physics '98

Levinthal, Elliott C.
Stanford University
Physics

Sargent, Anneila I.
California Institute of Technology
Astronomy/Astrophysics

**SPECIFIC GUIDANCE FOR RESPONDING TO
CAN 00-OSS-01
NASA ASTROBIOLOGY INSTITUTE - CYCLE 2**

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B.1 Introduction

B.1.1 General Provisions and Policies

- Use of Proposals. Proposals received in response to a Cooperative Agreement Notice (CAN) will be used only for evaluation purposes. NASA does not allow a proposal, the contents of which are not available without restriction from another source or any unique ideas, submitted in response to a CAN to be used as the basis of a solicitation or in negotiation with other organizations, nor is a preaward synopsis published for individual proposals.
- Public Record. A solicited proposal that results in a NASA award becomes part of the record of that transaction and may be available to the public on specific request; however, information or material that NASA and the awardee mutually agree to be of a privileged nature will be held in confidence to the extent permitted by law, including the Freedom of Information Act.
- Nominal Period of Performance for Selected Proposals. The period of performance for a proposal submitted in response to this CAN is restricted to five years. Yearly funding allotments are provided only after the submission of an acceptable progress report. In accordance with Federal regulations, further funding after three years requires the submission and review of another complete proposal. The period of performance for an Education/Public Outreach (E/PO) proposal is restricted to that of its “parent” research award (see Appendix C).

Unrestricted Freedom to Propose to this CAN. NASA OSS welcomes proposals in response to this CAN from all qualified proposers. Participation in this program is open to all categories of U.S. and non-U.S. organizations, including educational institutions, industry, nonprofit institutions, NASA Centers, and other Government agencies. Historically Black Colleges and Universities (HBCU’s), other minority educational institutions, and small businesses and organizations owned and controlled by socially and economically disadvantaged individuals or women are particularly encouraged to apply. In accordance with Federal statutes and NASA policy, no eligible applicant shall be excluded from participation in, denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NASA on the grounds of race, color, creed, age, sex, national origin, or disability.

- Opportunity to Propose Education/Public Outreach Activities. Education/Public Outreach (E/PO) activities are now considered vital and integral parts of all NASA space science missions and research programs. Therefore, NASA OSS encourages proposers to this CAN to submit an E/PO proposal as an element to their “parent” research proposal in accordance with the guidelines given in Appendix C.
- Anticipated Level of Competition for Selection. Regardless of the budgets that are indicated as available for this program, prospective proposers are advised that NASA programs are traditionally extremely competitive. As a general rule, funding limitations prevent the selection of all submitted proposals of high quality.
- Public Access to Data. As a matter of NASA policy, all data taken or products created in the performance of a NASA research award are considered to be public domain. In addition, NASA may judge that new data or products (including items produced in the pursuit of an Education/Public Outreach proposal) obtained through an investigation selected through this CAN may be of value to the science and/or education communities at large. If so, NASA

reserves the right to direct that such items be deposited in an approved publicly accessible site and will negotiate appropriate funding to enable such activities (e.g., the reduction and calibration of the data into a format amenable for use by peer scientists).

- NASA-Provided Data and Computational Infrastructure. OSS provides data and computational infrastructure to support its research community. Information on current space science data centers and services can be found at <http://ssds.nasa.gov>.

- Late proposals. Late proposals may be considered only if they are judged to be in the best interests of the Government. Owing to the historically large over-subscription of proposals for NASA's programs, a proposal submitted after the published deadline is unlikely to be considered of uniquely greater value to NASA than the proposals that are submitted on time. Finally, note that processing delays at the proposer's home institution or its method of shipping does not excuse the late submission of a proposal.

B.1.2 Types of Proposing Institutions

NASA OSS accepts proposals in response to its programs from all types of U.S. and non-U.S. institutions (proposals from non-U.S. institutions must adhere to the provisions of Section 9.2 in the main body of this CAN). As an aid to NASA in deciding on the appropriate type of award or agreement in the event that the proposal is selected, one of the categories listed below must be indicated at the appropriate line on the proposal's Cover Page (see Section 5.3 of this Appendix):

Educational institution -- A university or two- and four-year college (including a U.S. community college) accredited to confer degrees beyond that of the K-12 grade levels (all such institutions are considered by NASA as nonprofit).

- Nonprofit, nonacademic organization -- A private or Government supported research laboratory, university consortium, museum, observatory, or similar organization that supports advanced research but whose principal charter is not the training of students.
- Commercial organization -- An organization of any size that operates for profit (fee basis) and with appropriate capabilities and interests to conduct basic research in science.
- NASA Center -- All NASA Field Centers and the Jet Propulsion Laboratory.
- Other Federal Agency -- Any non-NASA, U.S. Federal Executive agency or Federally Funded Research and Development Center (FFRDC) sponsored by a Federal agency.
- Unaffiliated U.S. resident -- Any person residing in the U.S., whether a U.S. citizen or resident alien, who has the capabilities and access to facilities for carrying out the proposed project and who, if selected, agrees to fiscal arrangements that, in NASA's opinion, ensures responsible management of appropriated Federal funds.
- Non-U.S. Organizations -- Institutions outside the U.S. that propose on the basis of a policy of no exchange of funds (consult Section 9.2 of the CAN for specific details).

B.1.3 Proposal Personnel

Every organization submitting a proposal in response to this CAN must designate a single Principal Investigator (PI) who will be responsible for the quality and direction of the entire proposed investigation and for the use of all awarded funds. Note that NASA does not accept the designation of a "Co-Principal Investigator;" there must be only one PI who is solely responsible for an investigation.

NASA strongly encourages proposers to identify only the most critically important personnel to aid in the execution of their proposals. Co-Investigators (Co-I's) may be identified who are critical for the successful completion of an investigation through the contribution of unique expertise and/or capabilities, and who serve under the direction of the PI, regardless of whether or not they receive compensation directly under the award. A Co-I must have a well-defined role in the investigation that is explicitly defined in the Management section of the proposal (see Section B.5.3 below). In addition, for all proposals submitted in response to this CAN, evidence of the commitment of all Co-I's to participate in the proposed investigation is required by way of a brief statement even if they are from the same institution as that of the PI (see Section B.5.3 below).

There are two informal subcategories of Co-I's that a proposal may identify in its Management section (see Section B.5.3 below), as appropriate:

- A Co-I may be additionally designated as the "Science PI" for those cases where the proposing institution does not permit that individual to formally serve as the PI as defined above. In such a case, the Science PI will be understood to be in charge of the scientific direction of the proposed work, although the formally designated PI is still held responsible by NASA for the overall direction of the effort and the use of funds.
- A senior, leading Co-I may be additionally designated as an "Institutional PI" if his/her institution is committed to make a major contribution to a proposal submitted by a PI from another institution. At the recommendation of the NAI Director, NASA may elect to provide an award directly to that Co-I institution with the Institutional PI serving as the "PI" for what otherwise would be a subcontract from the proposing PI institution. However, in such a case, the proposal's designated PI is still held responsible by NASA for the overall scientific direction of the proposed effort.

B.1.4 Proposal Evaluation

The evaluation criteria for this program are given in Section 6.0 of the main body of this CAN. Although NASA makes every effort to secure scientific and technical evaluations from appropriately qualified peers of the proposers, proposers should provide sufficient detail to enable evaluation by persons who are knowledgeable of, but not necessarily specialists in, the proposed research. Evaluation criteria for the E/PO elements of proposals are given in Appendix C.

B.1.5 Proposal Selection and Implementation

The selection procedures are given in Section 6.0 in the main body of this CAN. A critical consideration in the selection of proposals for funding will be to maximize scientific return within the available budget. To achieve this objective, NASA will weigh the proposed costs of those proposals deemed meritorious against the available funding; final selection will reflect an appropriate balance. The Selecting Official will also decide on the selection of Education/Public Outreach (E/PO) proposals of merit that are associated with those research proposals being considered for selection. An E/PO proposal of merit will be used as an additional factor to discriminate between research proposals of otherwise equal merits.

Each proposer will be notified by postal or electronic mail of their selection or nonselection and offered a debriefing to explain that decision. Note that NASA reserves the right to offer selection of only a portion of a proposed investigation; in such a case, the proposer will be given the opportunity to accept or decline the offer. Those recommended for selection will be informed of the recommended amount of their award and their organization will be contacted by a NASA Procurement Office to arrange for an appropriate funding instrument (for this program, it is expected that a Cooperative Agreement will be sought for all selected institutions other than Government agencies, for which an interagency transfer of funds will be used). In all cases, awards are made to the proposing institution, not directly to the proposal PI. No financial commitment on the part of NASA or the Government may be inferred from any communication, even if in writing, from the NASA Program Scientist, NAI Director, NAI Assistant Director, or Selecting Official. Only a NASA Procurement Office can make financial commitments, obligations, or awards on behalf of the Agency and authorize the expenditure of funds.

B.2 Notice of Intent to Propose

In order to plan for a timely and efficient peer review process, Notices of Intent (NOI's) to propose are requested by the date given in Section 9.1 of the main body of this CAN. The submission of a NOI is not a commitment to submit a proposal, nor is information contained therein considered binding on the submitter. NOI's are to be submitted electronically by entering the requested information through the World Wide Web site identified in Section 9.1, which will request the following information:

- the Principal Investigator's name, physical location mailing address, phone number, and E-mail address;
- the name(s) and institution(s) of any Co-Investigator(s) known by the NOI due date;
- a "Yes/No" indication of the intent to submit an E/PO proposal;
- a descriptive title of the intended investigation; and,
- a brief description of the investigation to be proposed.

A separate NOI must be submitted for each intended proposal. Note that this NOI is also the preliminary version of the proposal Cover Page/Proposal Summary; therefore, the Web site will provide a password to the proposer for future use in updating this information for the final Cover Page/Proposal Summary as the deadline for submission of the final proposal approaches (see further discussion in Section B.5 below).

B.3 Guidelines for International Participation

Guidelines for proposals involving non-U.S. participation either as the Principal Investigator or as a Co-Investigator must follow the guidelines given in Section 9.2 of the main body of this CAN. Note especially the requirement for the submission of a letter of endorsement from the government agency or funding/sponsoring institution that is sponsoring the non-U.S. participation.

B.4 Guidelines for Preparation of Proposals

B.4.1 Standard Default Formats

The standard, default formats for all proposals submitted in response to this CAN are as follows:

- Typewritten English text using an easily read font having no more than 15 characters per inch on white, 8.5x11 inch paper (or A4 stock for non-U.S. proposals).
- Single or double column format with at least 1 inch (2.5 cm) margins all around.
- Double-sided printing preferred but not required.
- Bound only with metal staples to facilitate recycling (i.e., no cardboard or plastic covers or permanent binders), with the original copy bound in a manner that allows easy disassembly should NASA need to make additional copies.
- No fold out pages, colored illustrations, or photographs unless critical for the unique display of important proposal data.
- No material submitted on any type of electronic media, nor reference to World Wide Web sites for material needed to complete or to review the proposal.
- Use of only metric and standard engineering units.
- Strict adherence to the fixed page limits given in Section B.5.2.

B.4.2 Checklist For Proposal Preparation and Submission

All proposals are to include the following materials in the order and using the titles as given. Details for each item are given in the same order in Section B.5.3.

PRESUBMISSION ACTIVITIES

_____ *Notice of Intent (NOI) to Propose* - The NOI should be electronically submitted by the date indicated to the World Wide Web site given in Section 9.1 of the CAN.

_____ *Cover Page/Proposal Summary* - The information required for the *Cover Page/Proposal Summary* is to be electronically submitted to the World Wide Web site given in Section 9.1 of the CAN according to the directions below. It is then printed out in hard copy by the proposer in order to procure the required original signatures on a printed hard copy for submission with the copies of the proposal itself by the deadline given in Section 9.1 of the CAN.

CONSTITUENT PARTS OF A PROPOSAL

(required and optional, in order of assembly, bound in two separate volumes)

PAGE LIMITS***Volume I:**

• Cover Page/Proposal Summary	Per printout from Web
• Proposal Title Page (optional)	1
• Table of Contents	1
• Executive Summary	3
• Summary of Personnel, Commitments, and Costs	1
• Research/Training/Management Proposal	70**
• References	None
• Education/Public Outreach Proposal (optional)	Per printout from Web
• Institutional Commitment	5

Volume II:

• Cover Page/Proposal Summary (repeat from Volume I)	
• Facilities And Equipment (as appropriate)	5
• Curriculum Vitae	For the PI: 3
	For each Co-I: 1
• Current and Pending Support	None
• Statement(s) of Commitments from Proposing Personnel	None
• Letters of Commitment from Consortium Institutions	None
• Research Budget Summary and Details	None
• Reprints/Preprints (optional)	None

* where each side of a sheet containing text or illustration counts as a page and each “n-page” fold-out counts as n-pages.

** including illustrations, tables, and figures.

SUBMISSION ACTIVITIES

_____ *Cover Page/Proposal Summary* - print out final and complete version from specified Web site to secure the Principal Investigator and Authorizing Institution signatures, and to produce the required number of hard copies to be submitted (original signed *Cover Page/Proposal Summary* to preface original of proposal).

_____ *Education/Public Outreach Proposal* (optional) - print out final and complete version from specified Web site to include as part of final hard copy of proposal.

_____ Provide for delivery of the specified number of hard copies (20 plus signed original) of the proposal to the designated address by close of the normal business day on the specific Due Date (see Section 9.1 of the CAN).

B.4.3 Details of Proposal Contents

All proposals in response to this OSS CAN should be assembled with the following parts in the order listed (note that some are optional). Proposals that omit any of their required parts will be returned without review.

- *Cover Page/Proposal Summary*

All proposals must be prefaced by an integrated *Cover Page/Proposal Summary* that contains the information specified below. This item is produced by first entering the requested information electronically through a World Wide Web site (specified in Section 9.1 of the CAN) and then printing out this form by the proposer. A sample of this Web form may be printed out at any time for preliminary inspection. The only valid format for submission of this item is through the Web. The printed copy of the electronically submitted form (typically three to four pages long) is then used to obtain original signatures of the PI and an official from the proposing institution to submit with the original copy of the proposal. In addition, reproductions of this original *Cover Page/Proposal Summary* are used to preface the required printed copies of the proposal.

Upon accessing the specified Web site, the following information for the *Cover Page* will be requested:

- Name and full institutional mailing address of the proposing Principal Investigator, telephone and facsimile numbers, and E-mail address (Note: an open block for signature and date will be provided on the printed hard copy).
- Full descriptive title of proposed investigation.
- Abbreviated title of proposed investigation (limited to 50 characters).
- NASA Grant or Contract Number of any current NASA award that the PI may hold that is a logical predecessor of the newly proposed work.
- Names, institutional affiliations, and E-mail addresses of any Co-Investigators (see definition of Personnel in Section B.1.3; also note that all listed Co-I's must also be functionally identified in the proposal - see Section B.5.3).
- The physical mailing address, telephone number, and E-mail address of the office of sponsored research programs at the proposing institution.
- Institutional endorsement, including the name and title of the Authorizing Official, name of proposing institution (Note: an open block for signature and date will be provided on the printed hard copy).
- Designation of the type of institution per the definitions in Section B.1.2 above (a menu is provided).
- A "Yes/No" indication whether an E/PO proposal is also submitted.
- The summary budget for any optional E/PO proposal that is submitted with the proposal both by year and for the total proposed period of performance.
- The summary budget for the proposed research task both by year and for the total proposed period of performance.

A block of space (<2500 characters, including spaces, or about one-half page using the formats specified above) will be provided in the electronic *Cover Page/Proposal Summary* form for a self-contained *Proposal Summary* of the proposed research activity. Note that this Web site will allow this submission by transfer from any standard word processing software. The *Summary* provides background and perspective to the interested reader and, therefore, must include the following information:

- A description of the key, central objectives of the proposed research activity in terms that a non specialist can grasp and a statement of methods proposed to accomplish those proposed objectives;
- The perceived significance of the proposed work to NASA OSS interests; and
- If the proposal contains a Education/Public Outreach proposal, a brief summary of the intended activity.

Special conditions and instructions concerning the *Cover Page/Proposal Summary*:

1) Changes (such as whiteout or additions) to the *Cover Page/Proposal Summary* as printed from the Web are not permitted. Any needed changes to the electronically submitted information may only be made by editing the electronic submission by following the instructions of the Web page, after which the final *Cover Page/Proposal Summary* is then printed in order to secure the necessary signatures.

2) The authorizing institutional signature on the *Cover Page* certifies that the proposing institution has read and is in compliance with the three required certifications printed in full in Section B.6 of this Appendix; therefore, it is not necessary to separately submit these certifications with the proposal.

3) Electronic submission of a *Cover Page/Proposal Summary* does not satisfy the deadline for proposal submission. The required number of proposal copies (see cover letter), must be received at the indicated address by the proposal due date.

4) NASA OSS will publish the name of the proposal, the PI, the proposing institution, and the *Proposal Summary* of every selected investigation in a public data base (see <http://spacescience.nasa.gov/codesr/results.html>). Therefore, the Summary should not include proprietary information that precludes its unrestricted release (see further on proprietary information below).

• *Proposal Title Page*

The *Proposal Title Page* is optional, and its design is at the discretion of the proposer. If one is included, at a minimum it must include the full title of the proposal, the name of the Principal Investigator, the name and address of the proposing institution, and a list of any other institutions participating in the proposed investigation. In addition, as required, this page may contain a “Notice of Restriction on Use and Disclosure of Proposal Information” in accordance with the following policy:

It is NASA policy to use information contained in proposals for evaluation purposes only. While this policy does not require that the proposal bear a restrictive notice, offerors or quoters should, in order to maximize protection of trade secrets or other information that is commercial or financial and confidential or privileged, place the following Notice on the Title Page of the proposal and specify the information subject to the Notice by inserting appropriate identification, such as page numbers, in the Notice. In any event, information (data) contained in proposals will be protected to the extent permitted by law, but NASA assumes no liability for use and disclosure of information not made subject to the Notice.

Notice of Restriction on Use and Disclosure of Proposal Information

The information (data) contained in [insert page numbers or other identification] of this proposal constitutes a trade secret and/or information that is commercial or financial and confidential or privileged. It is furnished to the Government in confidence with the understanding that it will not, without permission of the offeror, be used or disclosed other than for evaluation purposes; provided, however, that in the event a contract (or other agreement) is awarded on the basis of this proposal, the Government shall have the right to use and disclose this information (data) to the extent provided in the contract (or other agreement). This restriction does not limit the Government's right to use or disclose this information (data) if obtained from another source without restriction.

- *Table of Contents*

A *Table of Contents* shall identify each of the key parts of the proposal, as well as the subsections of the proposal's central Research/Training/Management section. To facilitate developing and assembling the proposal, each of its principal sections may be individually numbered.

- *Executive Summary*

The *Executive Summary* should clearly describe the proposed program: its rationale, innovations, distinguishing features, unifying intellectual focus, proposed research, and training plans; its approach to management of its participating personnel and institutions; and any proposed Education/Public Outreach activities. In addition, this *Summary* should briefly address the proposed institutional commitment(s) as well as the commitment to implementing the collaborative and networking concepts of the NASA Astrobiology Institute.

- *Summary of Personnel, Commitments, and Costs*

The proposal must contain a one page summary list, in simple tabular form, that gives the names and intended work commitment for the PI and every Co-I of the proposed investigation both in time (rounded to the nearest 0.01 of a Work Year) and unburdened salary (rounded to the nearest \$1K) for each year of the proposed period of performance (Note: "unburdened" means without addition of overhead or fees). These entries of commitments should be shown separately for the research effort and for any proposed E/PO proposal.

- *Research/Training/Management Proposal*

The proposal should contain sufficient detail to fully describe the proposed effort in order to enable a reviewer to make informed judgments about the overall merit of the proposed research and about the probability that the investigators will be able to accomplish their stated objectives with the resources requested and with their own resources. In addition, the proposal should indicate clearly the interdisciplinary nature of the research, innovative approaches, and how the individual researchers (and their institutions, if a consortium of institutions is proposed) will be integrated so as to carry out the plan.

This section is the main body of a proposal and should cover the following topics in the order given, all within the specified limit of 70 pages:

- The objectives and expected significance of the proposed research, including a complete description of any instruments or hardware proposed to be built in order to carry out the research (Note: see also the Facilities and Equipment section below for the description of critical equipment needed for carrying out the proposed research).
- How the proposed work is expected to build on and otherwise extend the state of knowledge in the field.
- The technical approach and methodology to be employed in conducting the proposed research, including any special facilities of the proposing institution(s) and/or capabilities of the proposer(s) for carrying out the work.
- The relevance of the proposed work to past, present, and/or future NASA OSS programs and interests or to the specific objectives given in this CAN.
- An outline of the general plan of work, including anticipated key milestones for accomplishments and the management structure for the personnel involved.
- A statement of the expected contribution by the PI and each Co-I identified on the proposal, even if they do not derive support from the proposed budget (Note: Co-I's who have either insignificant or unjustified roles will be considered a weakness for purposes of the evaluation of the proposal).

Training opportunities for undergraduates, postgraduates, and/or postdoctoral associates should be explained in detail. This part should identify how qualified individuals will be recruited to this new field of research, and especially how the opportunities for interdisciplinary study and research will be enabled. The proposed selection process should indicate how adequate attention will be paid to the recruitment of women and minorities. This part should also summarize the training of students completed during the last three years under the direction of the proposed senior personnel as evidence of their experience and commitment to this important aspect of the NAI.

Each proposal must indicate how the activities of the researchers from different science disciplines will be integrated in implementing the proposed research program as well as any proposed E/PO effort. This part should define the roles and responsibilities of each participant and note the proportion of each individual's time to be devoted to the proposed research activity. The proposal should state clearly and unambiguously whether these key personnel have reviewed the proposal and endorsed their participation. If multiple institutions are involved in the proposal, this part should provide a specific plan for bringing the separate elements together into a well-functioning unit. If a consortium of institutions is proposed, letters verifying cooperation, coordination, and commitments of resources from administrative officials of the consortium members must be included as an appendix to the proposal.

This section may contain illustrations that amplify and demonstrate key points in the main text of the proposal (including milestone schedules, if appropriate). Any illustrations and figures must be of publication quality, of an easily viewed size, and have self-contained captions that do not contain critical information not provided elsewhere in the proposal.

- *References*

All citations given in the *Research/Training/Management Proposal* must be included in full in a list of references.

- *Facilities and Equipment*

As appropriate, this section should describe any facilities (including any U.S. Government owned facilities) and/or major equipment critical for carrying out the proposed project that are already available or would need to be purchased in order to carry out the proposed investigation. In the latter case, these costs should be entered in the required proposal *Budget Summary* and described in accompanying budget details.

- *Education and Public Outreach (E/PO) Proposal* (optional)

Proposals for E/PO efforts are strongly encouraged as an integral element of any proposal submitted in response to this CAN; see Appendix C. An E/PO proposal must be submitted through the designated Web site, which must also be printed out for submission in hard copy with the parent research proposal.

- *Institutional Commitment*

This part should provide in detail the specific resources that the proposing institution(s) will make available to this effort at reduced and/or no cost to NASA's Astrobiology Program, together with an estimate of the value of those resources to this program. The basis for this estimate should be clearly articulated so that the Government can accurately assess the proposed institutional commitment (see Section 5 in the main body of the CAN for examples of institutional commitment). This part should clearly show how these resources will benefit the implementation of the proposed research effort, the proposed training, education and outreach plan, and/or the development of the networked institute concept.

- *Curriculum Vitae*

The PI must submit a *Curriculum Vitae* (not to exceed three pages) that includes a history of his/her professional training and positions, and a bibliography of publications relevant to the proposal. The proposal must also include a one page *Vitae* for each Co-I. A Co-I who serves as a Science or an Institutional PI (see section B.1.3 above), or as the lead Co-I for an E/PO proposal, may submit a vitae using the same page limit as for the PI.

- *Current and Pending Support*

Information must be provided for all ongoing and pending projects and proposals that involve the proposing PI and any Co-I's who are expected to perform a significant share of the proposed

work (e.g., as a Science or as an Institutional PI; see section B.1.3 above), whether or not their contributions are specific costs in the proposal's budget. Information is required for each of two categories of support awards that exist at the time of the proposal submission deadline, namely:

- a) Current Support (for any of the period that overlaps with the proposal being submitted to this CAN), and
- b) Pending Support (including the proposal to this CAN).

For each of these categories, provide the following information for each such key individual on the proposal team as noted above:

- Title of award or project;
- Program name (if appropriate) and sponsoring agency or institution (including point of contact with telephone number);
- Proposed period of performance and budget; and
- Commitment in fractions of a full time Work Year (WY = 2080 hr).

In addition, provide the name of any other institution, including an individual point of contact with their telephone number, to which the proposal submitted to this CAN, or any part thereof, has been or will be submitted for consideration of funding. For such pending research, the PI's must notify the NAI Assistant Director immediately of any successful proposals that are awarded anytime after the proposal submission date until the time of selections.

• *Statement(s) of Commitment from Co-I's and/or Collaborators*

Every Co-I and Collaborator, from either a U.S. or from a non-U.S. institution, identified as a participant in the proposal must submit a brief, signed statement of commitment that acknowledges his/her participation even if they are from the PI's own institution. In the case of more than one Co-I and/or Collaborator, a single, multiply-signed statement is acceptable. Each statement should be addressed to the PI and must contain a specific reference to the proposal and the nature of the work being contributed. Facsimiles or E-mails are acceptable.

• *Letters of Commitment from Proposing Institutions*

Each member institution proposing as part of a consortium proposal must provide a letter signed by an appropriate member of its administration that certifies its commitment to its resources offered in the proposal (office space, computer or laboratory facilities, in-kind services, etc.).

• *Budget Summary and Details*

Proposals must contain a *Budget Summary* (format given in Section B.6 of this Appendix) for each year of the proposed effort, as well as for the total period of performance, filled out in accordance with the Instructions that follow the form. The Web site where this CAN is posted also has this form identified for downloading. Note especially the following important considerations:

- (i) If a proposal is selected for award, failure to adequately address the provisions of the Instructions for item 2.c will require that NASA contact the proposing institution for the required information. Such activity may delay the award until the purchase is either justified as a direct charge for general-purpose equipment or is budgeted as an indirect expense.

(ii) If a PI from a non-Government institution proposes to team with a Co-I from a U.S. Government institution (for this purpose, JPL is considered a NASA Center), then the institutional budget for that Government Co-I is to be included in the proposal's Budget Details, and the cost for this Government Co-I is to be listed on line 4, "Other Applicable Costs," of the Budget Summary. If the proposal is selected, NASA will execute an inter- or intra-Agency funds transfer, as appropriate, to cover the cost of the Government Co-I. Conversely, if a Government PI institution teams with a private sector Co-I institution, that Government institution is expected to cover such Co-I costs through a subcontract that they execute. Therefore, such private sector Co-I costs should be entered on line 2.a, "Subcontracts," on the Budget Summary.

(iii) The proposing (PI) institution must subcontract the funding of all proposal Co-I's who reside at other institutions (except for a Government Co-I for a private sector PI as noted above); that is, NASA will not separately make awards to Co-I's at distributed institutions regardless of the cost impact to the PI proposal for the management of such subcontracts.

(iv) In addition to the Budget Summary and in accordance with the Instructions for Budget Summary given in Section B.6 of this Appendix, the proposing institution must append at the end of the proposal sufficient details in narrative format to allow a full understanding of the budget. The proposing institution may also append the proposed budget in the format of their choice and without page limit.

(v) NASA expects to be operating on the basis of full cost accounting as soon as possible, including all Civil Service salaries with overhead. In the interim period, proposals involving NASA and JPL employees as either a PI or a Co-I should use the accounting method authorized at their institutions at the time proposals are due and for the entire proposed period of performance.

- *Reprints/Preprints*

Reprints/preprints of peer-reviewed publications that are considered critical to understanding the background of the proposal and that may not be easily available in the published literature may be appended to the proposal. However, even if such items are appended, NASA's peer reviewers are directed to base their judgments of the merits of the proposal only on its Research/Training/Management section and other related parts as described above.

B.5 Forms and Certifications

The following pages contain:

- (i) the Budget Summary format and Instructions for Budget Summary (Note: a reasonable facsimile of the Budget Summary may be generated by the proposer for submission or the electronic form may be downloaded) and
- (ii) copies of the three Certifications currently required by U.S. Code. (Note: These individual Certifications are included for reference only and need not be signed and returned; language is now included on the proposal *Cover Page* that is printed from the Web that confirms that these certification requirements are met once the *Cover Page* is signed by the Authorizing Institutional Representative and submitted with the proposal.)

BUDGET SUMMARY for RESEARCH PROPOSAL

For (check one):

___ Total Period of Performance from (M/D/Y) _____ to _____

___ For Year ___ of ___ from (M/D/Y) _____ to _____

		NASA USE ONLY			
	A	B	C		
1.	Direct Labor (salaries, wages, and fringe benefits)	_____	_____	_____	
2.	Other Direct Costs:				
	a. Subcontracts	_____	_____	_____	
	b. Consultants	_____	_____	_____	
	c. Equipment	_____	_____	_____	
	d. Supplies	_____	_____	_____	
	e. Travel	_____	_____	_____	
	f. Other	_____	_____	_____	
3.	Facilities and Administrative Costs	_____	_____	_____	
4.	Other Applicable Costs:	_____	_____	_____	
5.	Subtotal--Estimated Costs	_____	_____	_____	
6.	Less Proposed Cost Sharing (if any)	_____	_____	_____	
7.	Carryover Funds (if any)				
	a. Anticipated amount :				
	b. Amount used to reduce budget	_____	_____	_____	
8.	Total Estimated Costs	_____	_____	XXXXXXXX	
9.	APPROVED BUDGET	XXXXXXX	XXXXXXX	_____	

Instructions for Budget Summary

- Provide a complete Budget Summary for the total as well as each individual year of the proposed period of performance.
- Enter the proposed estimated costs in Column A (Columns B & C for NASA use only).
- Provide, as attachments, detailed computations of all estimates in each cost category with narratives as required to fully explain each proposed cost as follows.

1. Direct Labor (salaries, wages, and fringe benefits): Attachments should list the number and titles of personnel, amounts of time to be devoted to the grant, and rates of pay.
2. Other Direct Costs:
 - a. Subcontracts: Attachments should describe the work to be subcontracted, estimated amount, recipient (if known), and the reason for subcontracting.
 - b. Consultants: Identify consultants to be used, why they are necessary, the time they will spend on the project, and rates of pay (not to exceed the equivalent of the daily rate for Level IV of the Executive Schedule, exclusive of expenses and indirect costs).
 - c. Equipment: List separately. Explain the need for items costing more than \$5,000. Describe basis for estimated cost. General purpose equipment is not allowable as a direct cost unless specifically approved by the NASA Grant Officer. Any equipment purchase requested to be made as a direct charge under this award must include the equipment description, how it will be used in the conduct of the basic research proposed and why it cannot be purchased with indirect funds.
 - d. Supplies: Provide general categories of needed supplies, the method of acquisition, and the estimated cost.
 - e. Travel: Describe the purpose of the proposed travel in relation to the grant and provide the basis of estimate, including information on destination and number of travelers where known.
 - f. Other: Enter the total of direct costs not covered by 2a through 2e. Attach an itemized list explaining the need for each item and the basis for the estimate.
3. Facilities and Administrative (F&A) Costs: Identify F&A cost rate(s) and base(s) as approved by the cognizant Federal agency, including the effective period of the rate. Provide the name, address, and telephone number of the Federal agency official having cognizance. If unapproved rates are used, explain why, and include the computational basis for the indirect expense pool and corresponding allocation base for each rate.
4. Other Applicable Costs: Enter total explaining the need for each item.
5. Subtotal-Estimated Costs: Enter the sum of items 1 through 4.
6. Less Proposed Cost Sharing (if any): Enter any amount proposed. If cost sharing is based on specific cost items, identify each item and amount in an attachment.
7. Carryover Funds (if any): Enter the dollar amount of any funds expected to be available for carryover from the prior budget period. Identify how the funds will be used if they are not used to reduce the budget. NASA officials will decide whether to use all or part of the anticipated carryover to reduce the budget (not applicable to 2nd-year and subsequent-year budgets submitted for award of a multiple year award).
8. Total Estimated Costs: Enter the total after subtracting items 6 and 7b from item 5.

Certification Regarding Debarment, Suspension, and
Other Responsibility Matters

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 34 CFR Part 85, Section 85.510, Participant's responsibilities. The regulations were published as Part VII of the May 26, 1988 Federal Register (pages 19160-19211).

The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

Have not within three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Certification Regarding Lobbying

No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000, and not more than \$100,000 for each such failure.

Certification of Compliance with the NASA Regulations Pursuant to
Nondiscrimination in Federally Assisted Programs

The (Institution, corporation, firm, or other organization on whose behalf this assurance is signed, hereinafter called "Applicant ") hereby agrees that it will comply with Title VI of the Civil Rights Act of 1964 (P.L. 88-352), Title IX of the Education Amendments of 1962 (20 U.S.B. 1680 et seq.), Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.B. 794), and the Age Discrimination Act of 1975 (42 U.S.B. 16101 et seq.), and all requirements imposed by or pursuant to the Regulation of the National Aeronautics and Space Administration (14 CFR Part 1250) (hereinafter called "NASA") issued pursuant to these laws, to the end that in accordance with these laws and regulations, no person in the United States shall, on the basis of race, color, national origin, sex, handicapped condition, or age be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the Applicant receives federal financial assistance from NASA; and hereby give assurance that it will immediately take any measure necessary to effectuate this agreement.

If any real property or structure thereon is provided or improved with the aid of federal financial assistance extended to the Applicant by NASA, this assurance shall obligate the Applicant, or in the case of any transfer of such property, any transferee, for the period during which the real property or structure is used for a purpose for which the federal financial assistance is extended or for another purpose involving the provision of similar services or benefits. If any personal property is so provided, this assurance shall obligate the Applicant for the period during which the federal financial assistance is extended to it by NASA.

This assurance is given in consideration of and for the purpose of obtaining any and all federal grants, loans, contracts, property, discounts, or other federal financial assistance extended after the date hereof to the Applicant by NASA, including installment payments after such date on account of applications for federal financial assistance which were approved before such date. The Applicant recognized and agrees that such federal financial assistance will be extended in reliance on the representations and agreements made in this assurance, and that the United States shall have the right to seek judicial enforcement of this assurance. This assurance is binding on the Applicant, its successors, transferees, and assignees, and the person or persons whose signatures appear below are authorized to sign on behalf of the Applicant.

EDUCATION/PUBLIC OUTREACH (E/PO) PROGRAM

C.1 Scope of Program

The Office of Space Science (OSS) has developed a comprehensive approach for making education at all levels (with a particular emphasis on K-14 education) and the enhancement of public understanding of space science integral parts of all of its research missions and programs. To this end, OSS invites and encourages all proposers to this CAN to include an Education and Public Outreach (E/PO) component in their research proposals. The two key documents that establish the basic policies and guidance for all OSS E/PO activities are a strategic plan, entitled *Partners in Education: A Strategy for Integrating Education and Public Outreach Into NASA's Space Science Programs* (March 1995), and an implementation plan, entitled *Implementing the Office of Space Science (OSS) Education/Public Outreach Strategy* (October 1996). Both of these documents may be obtained by selecting Education and Public Outreach from the OSS homepage at <http://spacescience.nasa.gov>, or from Dr. Jeffrey Rosendhal, Office of Space Science, Code S, NASA Headquarters, Washington, DC 20546-0001.

The following policies and guidelines apply to the E/PO activities solicited through this CAN:

- The proposed E/PO activity is expected to have general intellectual linkage to the science objectives of its “parent” proposal and/or the science expertise of its PI;
- No more than 5% percent of the parent proposal’s research budget per year may be proposed for an E/PO program, although larger budgets may be considered for a few exceptionally meritorious activities (Note: a Budget Summary must be submitted as part of an E/PO proposal as described further below);
- The parent research proposal may identify an additional Co-Investigator who, along with the PI of the parent research proposal, will be responsible for completing the E/PO activities (e.g., an appropriately qualified colleague from the PI institution, or from an educational institution such as a public school district, science museum, planetarium, etc.);
- E/PO proposals will be evaluated (see criteria below) by appropriately qualified scientific, education, and outreach personnel, and the substance of these reviews will be conveyed to the proposers in a summary report; and
- The OSS Selecting Official will take into account proposed E/PO tasks and their review ratings when deciding on final selections and funding levels and as an aid in discriminating between highly qualified research proposals having otherwise comparable merits.

C.2 Evaluation Criteria

Based on the OSS E/PO strategy and implementation plans noted above, there are two classes of evaluation criteria against which proposed E/PO activities will be evaluated. Although creativity and innovation are certainly encouraged, note that neither of these sets of criteria concerns the originality of the proposed effort. Instead, NASA seeks assurance that the proposer is personally committed to the E/PO effort and that the PI of the parent proposal and/or appropriate research team members will be actively involved in carrying out a meaningful, effective, credible, and appropriate E/PO activity; that such an activity has been planned and will be executed; and that the proposed investment of resources will make a significant contribution towards meeting stated OSS plans and objectives (interested proposers to this E/PO program are urged to consult the *Explanatory Guide* referenced below).

General Criteria

The following general criteria will be applied to the evaluation of all proposals and reflect requirements necessary for further consideration by NASA OSS of an E/PO proposal:

- The quality, scope, and realism of the proposed E/PO program including the adequacy, appropriateness, and realism of the proposed budget;
- The capabilities and commitment of the proposer and the proposer's team to carry out the proposed E/PO program, including the direct involvement of one or more science team members in overseeing and carrying out the proposed E/PO program (Note: this criterion is intended to preclude proposals that serve only to "pass through" money to an external organization or individual who would carry out the proposed E/PO activity, since such a case is inconsistent with the intention of OSS that the research community be actively involved in education and public outreach);
- The establishment or continuation of effective partnerships with institutions and/or personnel in the fields of educational and/or public outreach as the basis for and an integral element of the proposed E/PO program; and
- The appropriateness of plans for evaluating the effectiveness and impact of the proposed education/outreach activity.

Specific Criteria

To ensure that the goals and objectives of the OSS E/PO strategy are realized in practice, E/PO proposals for this CAN must address at least at least one of the following specific criteria. In any event, a sound, well-posed, and focused effort that will clearly be effective in reaching its intended target audience is preferable to an unrealistically broad effort. These specific criteria are:

- For proposals dealing directly with or strongly affecting the formal education system (e.g., teacher workshops or student programs carried out at public institutions such as science museums and planetariums), the degree to which the proposed E/PO effort is aligned with and linked to nationally recognized and endorsed education reform efforts and/or reform efforts at the state or local levels;
- The degree to which the proposed E/PO effort contributes to the training, involvement, and broad understanding of science and technology by underserved and/or underutilized groups; and/or
- The potential for the proposed E/PO activity to expand its scope by having an impact beyond the direct beneficiaries (e.g., reaching relatively large audiences, being suitable for replication or broad dissemination, and/or drawing on resources beyond those directly requested in the proposal).

OSS has developed a document, entitled *Explanatory Guide to the NASA Office of Space Science Education and Public Outreach Evaluation Criteria*, as a resource for proposers who want to submit an E/PO proposal in conjunction with their research proposal. This *Explanatory Guide* may be accessed through the OSS homepage Web site indicated above or directly at <http://www.hq.nasa.gov/office/oss/education/guide.html/> ; navigation through this *Explanatory Guide* at its Web site is facilitated by internal active links. This *Guide* is not an extension of the E/PO requirements or criteria but is meant to provide an easy-to-follow introduction to this program using a series of Frequently Asked Questions (FAQ), followed by a detailed discussion of the E/PO review criteria given below. All proposers who are considering the submission of an E/PO proposal but who are not familiar with the specific OSS standards for E/PO activities are urged to review this *Explanatory Guide*.

C.3 Assistance for the Preparation of E/PO Proposals

To help interested proposers in developing a effective E/PO proposals, NASA OSS has established a nationwide support infrastructure of space science education/outreach groups, one whose major purpose is to directly aid space science investigators in identifying and developing high quality E/PO opportunities. This infrastructure provides the coordination, background, and linkages for fostering partnerships between the space science and E/PO communities, and the services needed to establish and maintain a vital national, coordinated, long-term OSS E/PO program. The two elements of this system of particular interest to researchers interested in submitting E/PO proposals are:

- Four OSS science theme-oriented “E/PO Forums” that aid OSS in organizing the comprehensive education/outreach aspects of OSS space science missions and research programs, and provide both the space science and education communities with ready access to relevant E/PO programs and products; and
- Five regional “E/PO Broker/Facilitators” that search out and establish high leverage opportunities, arrange alliances between educators and OSS-supported scientists, and help scientists turn results from space science missions and programs into educationally-appropriate activities suitable for regional and/or national dissemination.

Prospective proposers are strongly encouraged to make use of these groups to help identify suitable E/PO opportunities and arrange appropriate partnerships and alliances but should note that the responsibility for actually developing the E/PO program and writing the proposal is that of the proposer. Points of contact and addresses for all of these E/PO Forums and Broker/Facilitators are found by opening Education and Public Outreach from the menu of the OSS homepage at <http://spacescience.nasa.gov>.

C.4 Preparation and Submission of an E/PO Proposal

To aid interested proposers in composing and submitting a complete E/PO proposal, NASA OSS has established a comprehensive electronic form that is accessed through the menu on the Web site <http://www.lpi.usra.edu/panel/>. Completion of all the fields of this electronic form with the requested information and text is necessary before a proposal may be submitted for evaluation (Note: only electronically submitted E/PO proposals will be evaluated). This site may be accessed at any time up to the due date for proposals as given in the main body of this CAN, and by using a unique identification number that will be provided at the time of first access, all fields may be edited up to final submission. The requested information may be transferred from any standard word processing software, although only text may be used to complete these fields on this Web site; i.e., this site will not accept illustrations or drawings. As an aid in developing the required information for the final electronic submission, this E/PO format may also be printed at any time.

This Web submission also requires a summary of the E/PO budget (both total and by year) using the same format shown for the research Budget Summary form shown in Appendix B.6 in this CAN. It is not necessary to integrate the E/PO budget with that of its parent research proposal; however, it is necessary to state the summary E/PO budget (in total and by year) on the proposal Cover Sheet (see Section B.5.2).

Once it is submitted, the completed E/PO proposal (including all Budget Summary sheets) can then be printed out from the Web site by the proposer to provide the appropriate hard copy for submission with their parent research proposal as indicated in Section B.

C.5 Reporting Activities for Approved E/PO Proposals

In order to assist OSS in obtaining a coherent picture of the entire portfolio of E/PO efforts supported across all OSS programs a brief report of selected E/PO activities are to be provided as part of the annual Progress Reports required for the parent research award (Note: it is expected that all such Progress Reports for the proposals selected through this CAN will be submitted electronically through a to-be-designated Web site). In addition, one of the OSS Education Forums (see above) will contact the PI's of selected E/PO components to obtain basic summary information concerning the nature of and intended audience for their selected E/PO effort.

C.6 Additional Information

Specific questions about the NAI Outreach Office and the coordinated activities of the NAI Lead Teams may be directed to:

Helen Matsos
NAI Outreach Manager
NASA Astrobiology Institute
Mail Stop 240-1
Ames Research Center
National Aeronautics and Space Administration
Moffett Field, CA 94035-1000
Phone: (650) 604-0809 (NAI Secretary)
E-mail: NAIcon2@mail.arc.nasa.gov

General questions about the OSS E/PO program may be directed to:

Dr. J. David Bohlin
Research Program Management Division
Code SR
Office of Space Science
National Aeronautics and Space Administration
Washington DC 20546-0001
Phone: (202) 358-0880
E-mail: david.bohlin@hq.nasa.gov